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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,473	04/22/2005	Kunihiro Oda	OGOSH31USA	1626

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EXAMINER	
ROE, JESSEE RANDALL	

ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
08/14/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@howsonandhowson.com

Office Action Summary	Application No.	Applicant(s)	
	10/532,473	ODA, KUNIHIRO	
	Examiner	Art Unit	
	Jessee Roe	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2009 & 21 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *30,32 and 35-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *30,32 and 35-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20 January 2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 January 2009 has been entered.

Status of the Claims

Claims 30, 32 and 35-45 are pending wherein claims 35-37 are amended, claims 39-45 are new and claims 1-29, 31 and 33-34 are canceled.

Election/Restriction

Applicant's cancellation of claim 34 and amendments to claims 35-38 renders the restriction set forth in the Office Action of 23 March 2008 requiring an election between claims 30 and 32-33 and claims 34-38 moot.

Status of Previous Rejections

The previous rejection of claims 30 and 32 under 35 U.S.C. 103(a) as being unpatentable over Michaluk et al. (US 6,348,113) is withdrawn in view of the Applicant's arguments and amendments to claim 30.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 36-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to the recitation "wherein said forging and forging or rolling steps performed immediately before said second and additional recrystallization steps, respectively, are cold mix forging steps." in claim 36, claim 30 does not recite a rolling step before the second recrystallization annealing step. Furthermore, it is unclear how a rolling step can also be a cold mix forging step.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 30, 32 and 35-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turner (US 6,331,233).

In regards to claims 30 and 39, Turner (‘233) discloses a method of manufacturing tantalum sputtering targets wherein vacuum-melted or electron beam

melted tantalum ingots would be forged, rolled and annealed at a temperature in the range of 1500°F to 2800°F (1089K to 1811K) (col. 3, line 49 – col. 4, line 26). Turner ('233) further discloses annealing in an inert atmosphere at a temperature in the range of 1500°F to 2800°F (1089K to 1811K) to recrystallize the microstructure; utilizing at least three deformation steps wherein the at least three deformation steps can be forging, rolling, or extrusion and no less than three inert-atmosphere steps from ingot to final target plate thickness to achieve a mean grain size of less than 100 μm and a grain size of less than about 50 μm (Figure 3 and col. 3, line 49 – col. 4, line 26).

The Examiner notes that the annealing temperatures in addition to the resulting sputtering plate grain size disclosed by Turner ('233) overlap the annealing temperatures and resulting sputtering plate grain size of the instant invention, which is *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed temperatures of deformation and annealing and grain sizes from the temperatures of deformation and annealing and grain sizes disclosed by Turner ('233) because Turner ('233) discloses the same utility throughout the disclosed ranges.

With respect to the recitation "and the target being made to have no uneven macrostructure in the form of streaks or aggregates on a surface of the target and inside the target" in lines 15-17 of claim 30, Turner ('233) discloses a uniform texture throughout the component thickness (abstract and col. 2, lines 33-37).

With respect to the recitation "a Ta raw material having a purity of 4N5 (99.995%) or greater" in lines 3-4 of claim 30, merely purifying a known prior art composition would

not be sufficient to distinguish from the prior art composition. MPEP 2144.04 (VII).

In regards to claims 32 and 37, Turner (‘233) discloses repetitive alternating deformation (forging) and annealing steps wherein the annealing temperature is in the range of 1500°F to 2800°F (1089K to 1811K) (Figure 3 and col. 3, line 49 – col. 4, line 26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to conduct additional deformation (forging) and annealing at 1173 K since Turner (‘233) discloses repeated alternating deformation (forging) and annealing steps wherein the annealing temperature is in the range of 1500°F to 2800°F (1089K to 1811K).

In regards to claim 35, Turner (‘233) discloses forging prior to the first recrystallization annealing step. Although Turner (‘233) does not specify that the forging would be cold extend forging, neither the claim nor the specification defines cold extend forging such that cold extend forging would distinguish from regular cold forging and since Turner ('233) encompasses all types of forging, Turner ('233) meets the claim.

In regards to claims 36 and 41, Turner (‘233) discloses forging after the first recrystallization annealing step and subsequent forging and recrystallization steps. Although Turner (‘233) does not specify that the forging would be cold mix forging, neither the claim nor the specification defines cold mix forging such that cold mix forging would distinguish from cold forging and since Turner ('233) encompasses all types of forging, Turner ('233) meets the claim.

In regards to claim 38, Turner (‘233) discloses a mean grain size of less than 100 μm and a grain size of less than about 50 μm (Figure 3 and col. 3, line 49 – col. 4, line

26).

With respect to the recitation “wherein the Ta ingot or billet produced by said forming step has primary crystal grains of a diameter of roughly 50mm.” in claim 40, the Examiner notes that Turner (‘233) discloses electron beam melted tantalum ingots (col. 3, line 49 – col. 4, line 26). Therefore, primary crystal grains of a diameter of roughly 50mm would be expected. MPEP 2112.01 I.

In regards to the recitation “wherein said cold forging and second recrystallization annealing steps completely eliminate all heterophase and irregular crystal grains from the Ta ingot or billet" in claim 42, Turner (‘233) discloses substantially the same process in addition to a uniform texture throughout the component thickness (abstract and col. 2, lines 33-37), therefore elimination of all heterophase and irregular crystal grains would be expected. MPEP 2112.01 I.

In regards to claim 43, Turner (‘233) discloses forging after the first recrystallization annealing step and subsequent forging and recrystallization steps. Although Turner (‘233) does not specify that the forging would be cold forging, Turner ('233) encompasses all types of forging and therefore Turner ('233) meets the claim.

In regards to claims 44-45, Turner (‘233) discloses repetitive alternating deformation (forging) and annealing steps wherein the annealing temperature is in the range of 1500°F to 2800°F (1089K to 1811K) (Figure 3 and col. 3, line 49 – col. 4, line 26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to conduct additional annealing at 1173 K since Turner (‘233) discloses repeated alternating deformation (forging) and annealing steps wherein the

annealing temperature is in the range of 1500°F to 2800°F (1089K to 1811K). Additionally, Turner ('233) discloses a final target plate thickness having a mean grain size of less than 100 μm and a grain size of less than about 50 μm (Figure 3 and col. 3, line 49 – col. 4, line 26).

Response to Arguments

Applicant's arguments filed 20 January 2009 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that Turner ('233) fails to provide a disclosure of a tantalum raw material of a purity of 4N5 (99.995%) or higher and the problems associated with a raw material having a purity lower than 4N5 (99.995%).

In response, merely purifying a known prior art composition would not be sufficient to distinguish from the prior art composition. MPEP 2144.04 (VII).

Second, the Applicant primarily argues that Michaluk et al. ('113) starts with a rod and cuts it to form billet which can be subjected to annealing or alternatively can remain unannealed and then is subjected to axial or upset forging to produce a "perform", which can be subjected to annealing or alternatively can remain unannealed. The Applicant further argues that the perform is subjected to rolling to produce a "plate" and a final annealing is performed on the "plate"; the "billet" method of Michaluk et al. ('113) requires only one forging step after a billet is formed and claim 30 requires at least two forging steps. Additionally, the Applicant argues that claim 30, as amended, requires starting with a tantalum material having a 4N5 purity or greater and, in sequence, the

steps of forging, annealing at 1373 to 1673K (1100 to 1400°C), forging, annealing at 1373 to 1673K (1100 to 1400°C), forging or rolling, annealing at a temperature between a recrystallization starting temperature and 1373K (1100°C)

In response to the Applicant's arguments with respect to Michaluk et al. ('113), the previous rejection of claims 30 and 32 under 35 U.S.C. 103(a) as being unpatentable over Michaluk et al. (US 6,348,113) has been withdrawn in view of the Applicant's arguments and amendments to claim 30.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

/JR/